



SSGIC

Southern Sierra Geographic Information Cooperative

Analysis Workgroup

Meeting Notes

Feb. 13, 2001

Sequoia NF Supervisors Office - Conference Room

Participants

Consultant - Don Carlton, Fire Program Solutions

BLM - Larry Vredenburg, Maria Soto

CDF - Dave Drum

Kern County - Will Hanna, Mark Geary

NPS - Pat Lineback, Karen Folger, Jeff Manley (Sequoia/Kings), Kent Van Wagtendonk (Yosemite)

USFS - Brent Skaggs, Lew Jump, Karen Holmstrom

Objectives

- Develop solid understanding of the FLAMMAP/FOA and time permitting, WFSI analysis
- Develop detailed understanding of the data required to implement each analysis
- Set priorities, responsibilities, and timelines for completion of required datasets.

Discussions/Decisions/Assignments

Introductions and objectives

- Briefly reviewed SSGIC project for new participants. Yosemite sat in as observer to learn some about the analysis process. They are rewriting their fire management plan and are looking for analysis ideas. Will Hanna is a new GIS person for Kern and will be working closely with this project.
- Discussed past SSGIC decision to focus preliminary analysis effort on the Kern and Kaweah watersheds. Just a reminder for all that if data beyond those drainage's is easily available it should be gathered at the same time, however be cautious about spending a large amount of time and effort on areas outside the target drainage's at this time.
- Discussed need to start thinking about common data standards and business practices (e.g. establish common minimum mapping units for fires that will be updated by a given date each year in the corporate database) assuming the project will have a life beyond the initial pilot project stage.

Reviewed flow chart of analysis tools to be used by SSGIC

- FRID will function as a coarse analysis of ecological health/need for areas where that is an important objective
- FOA is a density analysis based on past ignitions (WHERE fires occur)
- FLAMMAP is an analysis of potential fire behavior if a fire should occur

- WFSI is an integration of FOA and FLAMMAP and describes WHERE fires are likely to occur and HOW they are likely to behave if they do occur. The WFSI serves as an indicator of fire hazard and potential risk.
- The "Asset Analyzer" (under refinement by Robin Marose's group) will provide an analysis of values at risk that will be assessed against the WFSI results.
- After the brief review, we discussed in detail each analysis (excluding the Asset Analyzer), its data needs, and tasks with assignments.

FRID (Fire Return Interval Departure)

- Rmax layer. This layer is derived from existing vegetation maps and descriptions. Veg information is combined with best available research and with expert and local manager knowledge of fire regimes. The result is a theme that spatially represents the fire regimes of the project area. **Tony Caprio** (NPS) is the lead on developing this layer in consultation with other land managers. **Karen Holmstrom** has provided existing veg layers to Tony.

- Fire history/occurrence. This spatial layer represents known fires as polygons or points. For purposes of the FRID analysis, ALL fires regardless of origin are needed. The primary attribute data for each point or polygon needed for the FRID analysis is year of occurrence.

Karen H. has some data already in a theme, but depth of information is uneven across the planning area.

Currently USFS has information in digital form through 1997 when the contract that was updating this theme expired. 1997 to present could be updated locally depending on resources available.

BLM began capturing the information in digital form in 1997 and has up through 1999 input. Earlier paper records exist could be used to extend the digital record.

Kern County expects to have the past 10 years of data for fires over 300 acres in digital form within 2 weeks. They will have 20 years input later this spring.

CDF will check to see what additional data is available. There may be statewide databases out there or local information that can be accessed.

NPS has all fires input through the 2000 fire season.

Assignments - **All agencies** agreed to submit to Karen Holmstrom within 30 days (deadline March 13th) a brief summary of fire history data including; 1) existing digital data 2) paper sources available that could be mined to extend the digital record (include information on scale and format of original data to be captured, e.g. "hand drafted polygon on 1:24000 map", "township/range/section coordinates in fire report") 3) description of minimum mapping units if known, 4) which years are covered by the source data, and 5) a rough estimate of the workload it would take to capture the records in digital form. Again, agencies were reminded to focus first on the Kern and Kaweah watershed, but include SSGIC project-wide needs if known. See an

example from Sequoia NP at the end of these notes for an idea of the level of detail to consider in this submission to Karen.

This information will be used to figure out ;1) what data we may need to develop in the short term for the pilot project areas (Kern/Kaweah), 2) to assess what kind of shape we are in across the SSGIC project area, and 3) assess long term needs for developing this data under other project proposals.

Fires to be mapped from old records should be mapped to the highest level of detail available. For example Kern County and CDF appear to use 300 acres as the minimum mapping unit for polygons, with smaller fires represented by point data. We can deal with that as the best available standard from those agencies where no other information is readily available. In the future, SSGIC and sponsoring agencies might consider adopting a common standard for fire mapping.

FOA (Fire Occurrence Area)

- FOA requires point data on ignition locations. We will use ignition point data from the period 1981-2000 and EXCLUDE only prescribed fire/management ignited fires. Included will be ALL other human ignitions AND lightning ignitions regardless of management response. Attributes to go along with the ignition location will be: year, cause (cause categories = human, lightning, misc./unknown), and final acres.

Ignition databases reside in a variety of forms and formats across the agencies, but seem to be generally available. USFS information is contained in the Personal Computer Historical Analysis (PCHA) database, NPS data is in the Boise SACS system, and CDF in state databases. BLM's records also reside on a NIFC system and can be accessed by the unit. Kern's records will soon extend through the past 10 years, but should be available for the past 20 years by later in the spring. Some formats may only record a township/range/section for the ignition point. In that case, the centroid of the section will be assumed as the point of ignition.

Each agency is responsible for getting their data in digital format to Karen Holmstrom. **Karen** will take the points and related attributes and combine them into a common database. She will then perform a spatial density analysis on the points. Points of contact for each agency responsible for the submission of this information to Karen are; **Dave Drum**-CDF, **Will Hanna**-Kern County, **Maria Soto**-BLM, **Karen Folger**-NPS. **Karen H.** will be responsible for retrieving all USFS data as well as contacting BIA for their information.

Don Carlton will check with Jones & Stokes on the exact algorithm used to perform the density analysis since there are several choices. His general recommendation is to use one that goes out to at least a 2300 meter neighborhood to capture centroids of other cells.

The density analysis output will be examined and stratified into fire occurrence area categories that will represent - rate of fires/per 1000 acres/year.

FLAMMAP

- Fundamentally FLAMMAP uses the same data inputs as does FARSITE and runs on FARSITE landscape files. We decided to add the optional data layers needed to capture crown fire potential.

- Elevation, aspect, and slope themes have been developed by Karen H.

- For the weather inputs to the model we will use one or more of the 11 fire weather stations in the SSGIC project area. **Brent** and **Don** will get together, in consultation with other agencies, to sort through how to go about assigning weather influence zones to the landscape. **Karen H.** will get weather station location and identifier information to **Don Carlton**.

A preliminary analysis will be performed to see which, if any, of the 11 stations appear similar or redundant as far as the analysis goes. Once that is determined, influence zones will be assigned to the remaining stations, probably in a meeting with fire behavior folks from each agency. Agency fire behavior folks mentioned as contacts to work on these issues included; **Brent Skaggs-USFS**, **Jack Ringer-Kern**, **Corky Conover-NPS**, **Joe Sing-CDF**. **Maria** will check on BLM contact and get that name to Brent. The polygons that are drawn to represent the influence zones will be created as a GIS theme by **Karen H.**

Since a separate FLAMMAP run must be performed for each probability class of spread component (low, moderate, high, extreme) within each weather influence zone separately, the fire influence zone polygons will become masks or clips of the total project area and a separate FLAMMAP landscape created for each. This process lends itself to being automated over time, so dealing multiple influence zones should not be much of a technical problem overall, and the creation of weather influence zones and the development of many landscape files should attempt to capture reasonable differences across the steep environmental gradients in the project area.

- Once the weather stations are selected, Firefamily runs are made on the data using spread component to identify low, moderate, high and extreme conditions. These categories and associated data will be used by the FLAMMAP analysis. FLAMMAP will be run separately within each fire influence zone under low, moderate, high, and extreme conditions as indicated by the Firefamily run. Again **Brent** will coordinate with agency fire behavior staff to work through these runs. Target date for completion of these tasks is April 15.

- Surface fuel model data will use from the standard NFFL models. Additional custom model data will need to be sent to **Karen H.** by the developing agency. NPS may have the only custom models in the project area? **Corky** can get that information to Karen. Some coverages appear to have problems and will need to be checked and corrected to the extent possible by each agency. It will **not** be Karen H.'s responsibility to verify accuracy of fuels data submitted.

- Canopy cover will use GAP data except where agencies have more specific information (NPS & USFS). **Karen H.** will compile this layer from the best data. Where cover data is provided as a range of cover (e.g. 10-20% cover) **Karen** will convert the range to a median (e.g. 10-20%

becomes 15%). She will also note the source of the data as an attribute since the data will be derived from different sources.

We may have to develop additional custom models for agricultural and urban lands. Some of these might be dealt with by a simple reclass to the NPS rock/water models (that don't burn), or a different model might better be developed that will do the same thing but show these areas as separate attributes.

- The optional themes needed to assess crown fire potential (stand height, canopy base height, and canopy bulk density) need some work. The USFS has considerable field and stand data that might be extended to adjacent lands for developing these themes. The NPS has some data but probably less robust than USFS. The "Fuels Management Analysis Suite" of software that includes the "Crownmass" module will be evaluated for utility in developing these themes across the project area. **Sequoia/Kings NP** has 2 copies of the software, and the SSGIC will procure one for Brent's use as well. **Brent** will take the lead, with assistance from other agency's fire behavior staff, to figure out what direction to take to develop these layers. **Don** will consult. Contracting the development of these layers is a possibility that **Brent** and team will explore and make recommendations on to the analysis team by **April 30**.

Don agreed to send a CD containing FLAMMAP and some sample data to Karen Holmstrom. **Karen** will copy the CD and send them out to each agency.

WFSI

- We didn't get too deep into the WFSI analysis. It requires the completion of the FOA and FLAMMAP analysis as precursors. Once those are substantially underway and we have a fairly firm completion date (hopefully before June), we will convene another meeting to put the components of the WFSI together.

For that meeting we will need agency fire behavior folks as well as good representation from GIS folks.

Each agency should bring information on a representation of real fire events for different fuel models that provide a good picture of rates of spread and final sizes. Some depth of local knowledge of fire behavior in different fuel types will also be critical. This information along with expert opinion will be necessary to produce some inputs for the WFSI model. It is half art and half science, but critical that it be backed by the best available information. Some thought should be given to maximum fire sizes that might be expected. More specific information will be provided when the meeting is scheduled.

Hope this captures our meeting and assignments adequately.

Please respond to the entire mailing list if you have updates or corrections to these notes. A lot was covered at the meeting (my brain still hurts!) and I may have inadvertently missed or misrepresented some critical information.

Thanks!
Jeff Manley
Sequoia & Kings Canyon National Parks 559-565-3125

EXAMPLE

Status of Fire History Data

Sequoia & Kings Canyon National Parks (SEKI)

- 1) Existing digital data – The parks have fire history records that date back to 1921. The recorded locations and polygons are stored as digital files in Arcview. Accuracy varies depending upon how the data was originally captured. Recent source data is generally more accurate and complete than the older records. Generally, polygons depicting actual fire perimeters are drawn where fires are 10 acres or larger. Fires smaller than 10 acres are captured as points, then buffered to a 30 meter square (or ¼ acre size) for incorporation into the fire history polygon data. At SEKI, all known fire perimeter data has been converted to digital GIS format. Attributes associated with each fire include information from the DI-1202 fire record.
- 2) Paper sources – The parks maintain extensive archives of fire history information. SEKI museum archives have a set of maps that were used to originally digitize the fire history into GIS. This museum also contains the original fire atlas developed by the Fire Management Office. Each fire has a record in the archives and may or may not have a map associated with the paper record. All fire records generally have at least township/range/section for older fires, or latitude/longitude and perhaps even UTM coordinates for more recent fires. When questions arise about the accuracy of a digital fire's mapped location, research can be conducted using the museum fire archives. They are considered the most complete record of fires. Recent fires are recorded on 1:24,000 quads as they occur, and transferred (digitized) into digital form as soon as possible but usually over the following winter.
- 3) Estimate of time to capture data into digital form – This task has been ongoing at Sequoia & Kings Canyon, and the records are now substantially complete and error checked. The digital GIS fire record is updated annually by the SEKI GIS fire specialist to incorporate the past seasons activity. The digital fire record is now accurate and complete through the 2001 fire season.

Meeting Participants
SSGIC Analysis
2/13/01

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